

SECTION 16124  
MEDIUM-VOLTAGE CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes cables and related splices, terminations, and accessories for medium-voltage electrical distribution systems.

1.3 DEFINITIONS

- A. NETA ATS: Acceptance Testing Specification.

1.4 SUBMITTALS

- A. Product Data: For each type of cable indicated. Include splices and terminations for cables and cable accessories.
- B. Samples: 16-inch (400-mm) lengths of each type of cable indicated.
- C. Qualification Data: For Installer.
- D. Material Certificates: For each cable and accessory type, signed by manufacturers.
- E. Source quality-control test reports.
- F. Field quality-control test reports.

1.5 QUALITY ASSURANCE

- A. Installer: Engage a cable splicer, trained and certified by splice material manufacturer, to install, splice, and terminate medium-voltage cable.
- B. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
  - 1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.
- C. Source Limitations: Obtain cables and accessories through one source from a single manufacturer.

- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- E. Comply with IEEE C2 and NFPA 70.

## 1.6 PROJECT CONDITIONS

- A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
  - 1. Notify Contracting Officer no fewer than two (2) days in advance of proposed interruption of electric service.
  - 2. Do not proceed with interruption of electric service without Contracting Officers written permission.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Cables:
    - a. American Insulated Wire Corp.; a Leviton Company.
    - b. General Cable Technologies Corporation.
    - c. Kerite Co. (The); Hubbell Incorporated.
    - d. Okonite Company (The).
    - e. Pirelli Cables & Systems NA.
    - f. Rome Cable Corporation.
    - g. Southwire Company.
  - 2. Cable Splicing and Terminating Products and Accessories:
    - a. Engineered Products Company.
    - b. G&W Electric Company.
    - c. MPHusky.
    - d. Raychem Corp.; Telephone Energy and Industrial Division; Tyco International Ltd.
    - e. RTE Components; Cooper Power Systems, Inc.
    - f. Scott Fetzer Co. (The); Adalet.
    - g. Thomas & Betts Corporation.
    - h. Thomas & Betts Corporation/Elastimold.
    - i. 3M; Electrical Products Division.

## 2.2 CABLES

- A. Cable Type: MV105.
- B. Comply with UL 1072, AEIC CS 8, ICEA S-93-639, and ICEA S-97-682.
- C. Conductor: Copper.
- D. Conductor Stranding: Compact round, concentric lay, Class B.
- E. Strand Filling: Conductor interstices are filled with impermeable compound.
- F. Conductor Insulation: Ethylene-propylene rubber.
  - 1. Voltage Rating: 15 kV.
  - 2. Insulation Thickness: 133 percent insulation level.
- G. Shielding: Copper tape, helically applied over semiconducting insulation shield.
- H. Shielding and Jacket: Corrugated copper drain wires embedded in extruded, chlorinated, polyethylene jacket.
- I. Cable Jacket: Sunlight-resistant PVC.

## 2.3 SPLICE KITS

- A. Connectors and Splice Kits: Comply with IEEE 404; type as recommended by cable or splicing kit manufacturer for the application.
- B. Splicing Products: As recommended, in writing, by splicing kit manufacturer for specific sizes, ratings, and configurations of cable conductors. Include all components required for complete splice, with detailed instructions.
  - 1. Combination tape and cold-shrink-rubber sleeve kit with re-jacketing by cast-epoxy-resin encasement or other waterproof, abrasion-resistant material.
  - 2. Heat-shrink splicing kit of uniform, cross-section, polymeric construction with outer heat-shrink jacket.
  - 3. Premolded, cold-shrink-rubber, in-line splicing kit.
  - 4. Premolded EPDM splicing body kit with cable joint sealed by interference fit of mating parts and cable.

## 2.4 SOLID TERMINATIONS

- A. Shielded-Cable Terminations: Comply with the following classes of IEEE 48. Insulation class is equivalent to that of cable. Include shield ground strap for shielded cable terminations.
  - 1. Class 1 Terminations: Modular type, furnished as a kit, with stress-relief tube; multiple, molded-silicone rubber, insulator modules; shield ground strap; and compression-type connector.

2. Class 1 Terminations: Heat-shrink type with heat-shrink inner stress control and outer nontracking tubes; multiple, molded, nontracking skirt modules; and compression-type connector.
3. Class 1 Terminations: Modular type, furnished as a kit, with stress-relief shield terminator; multiple-wet-process, porcelain, insulator modules; shield ground strap; and compression-type connector.
4. Class 1 Terminations, Indoors: Kit with stress-relief tube, nontracking insulator tube, shield ground strap, compression-type connector, and end seal.
5. Class 2 Terminations, Indoors: Kit with stress-relief tube, nontracking insulator tube, shield ground strap, and compression-type connector. Include silicone-rubber tape, cold-shrink-rubber sleeve, or heat-shrink plastic-sleeve moisture seal for end of insulation whether or not supplied with kits.
6. Class 3 Terminations: Kit with stress cone and compression-type connector.

## 2.5 ARC-PROOFING MATERIALS

- A. Tape for First Course on Metal Objects: 10-mil- (250-micrometer-) thick, corrosion-protective, moisture-resistant, PVC pipe-wrapping tape.
- B. Arc-Proofing Tape: Fireproof tape, flexible, conformable, intumescent to 0.3 inch (8 mm) thick, compatible with cable jacket.
- C. Glass-Cloth Tape: Pressure-sensitive adhesive type, 1/2 inch (13 mm) wide.

## 2.6 SOURCE QUALITY CONTROL

- A. Test and inspect cables according to ICEA S-97-682 before shipping.
- B. Test strand-filled cables for water-penetration resistance according to ICEA T-31-610, using a test pressure of 5 psig (35 kPa).

# PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Install cables according to IEEE 576.
- B. Pull Conductors: Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
  1. Where necessary, use manufacturer-approved pulling compound or lubricant that will not deteriorate conductor or insulation.
  2. Use pulling means, including fish tape, cable, rope, and basket-weave cable grips that will not damage cables and raceways. Do not use rope hitches for pulling attachment to cable.

- C. Support cables according to Division 16 Section "Basic Electrical Materials and Methods."
  - D. Install cable splices at pull points and elsewhere as indicated; use standard kits.
  - E. Install terminations at ends of conductors and seal multiconductor cable ends with standard kits.
  - F. Install separable insulated-connector components as follows:
    - 1. Protective Cap: At each terminal junction, with one on each terminal to which no feeder is indicated to be connected.
    - 2. Portable Feed-Through Accessory: Three.
    - 3. Standoff Insulator: Three.
  - G. Arc Proofing: Unless otherwise indicated, arc proof medium-voltage cable at locations not protected by conduit or termination materials. In addition to arc-proofing tape manufacturer's written instructions, apply arc proofing as follows:
    - 1. Clean cable sheath.
    - 2. Wrap metallic cable components with 10-mil (250-micrometer) pipe-wrapping tape.
    - 3. Smooth surface contours with electrical insulation putty.
    - 4. Apply arc-proofing tape in one half-lapped layer with coated side toward cable.
    - 5. Band arc-proofing tape with 1-inch- (25-mm-) wide bands of half-lapped, adhesive, glass-cloth tape 2 inches (50 mm) o.c.
  - H. Seal around cables passing through fire-rated elements.
  - I. Ground shields of shielded cable at terminations, splices, and separable insulated connectors. Ground metal bodies of terminators, splices, cable and separable insulated-connector fittings, and hardware.
  - J. Identify cables according to Division 16 Section "Electrical Identification."
- 3.2 FIELD QUALITY CONTROL
- A. Testing: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
  - B. Testing: Engage a qualified testing and inspecting agency to perform the following field tests and inspections and prepare test reports:
  - C. Perform the following field tests and inspections and prepare test reports:
    - 1. Perform each visual and mechanical inspection and electrical test stated in NETA ATS. Certify compliance with test parameters.

2. After installing medium-voltage cables and before electrical circuitry has been energized, test for compliance with requirements.
- D. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION